

Official Amendment
Serial No. 10/056,610
Docket : MIO 0051 V2/40509.183

REMARKS

Claims 30, 32-34, 40-45 and 50-53 were presented for examination. Claims 30, 32-34, 40-45 and 50-53 were rejected. Claims 30, 32, 33, 40-42 and 53 have been amended.

Rejections Under 35 U.S.C. § 103(a)

Claims 30, 32-34, 40-45, 50, 52 and 53 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hegel in view of Juskey. Applicant respectfully traverses this rejection.

Claim 30, as amended, recites, in part, a method of encapsulating an integrated circuit by forming a void 50 that extends from a first major face through an upper electrically conductive layer 36 into a resin laminate substrate 38. The void 50 does not extend into a lower electrically conductive layer 36 at the second major face (see Figs. 3 and 4).

In contrast, Hegel discloses plastic pin array packages that comprise a multilayer printed wiring board 10 with an array of pins 21 that extend completely through the printed wiring board 10 (Fig. 4; Col. 1, lines 6-9; Col. 4, lines 20-21). Examiner admits Hegel fails to teach "at least one void in the laminate so as to extend from one of the major faces through the electrically conductive layer into said underlying substrate, but not as far as said second major face and forming a solder resist layer over the conductive layer, so as to define a void portion over the void portion of the conductive layer" and cites Juskey.

However, Juskey fails to remedy the deficiencies of Hegel. Juskey discloses a flow formed encapsulated integrated circuit package comprising a printed circuit substrate having an upper and lower opposed surfaces and one or more anchor holes (Col. 2, lines 13-16). The substrate has conductive conductors on its surfaces (Col. 3, lines 10-11). The voids, or anchor holes 150, pass completely through the substrate 160 and its surface conductors (Fig. 2) and the bottom of the anchor holes 150 are covered by a lower solder mask 190 (Col. 4, lines 3-6).

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Juskey fails to disclose a void, or anchor hole, that does not extend as far as the lower conductive conductor layer of the substrate. Instead, Juskey discloses that the anchor holes 150 extend through the entire substrate 160 to the lower solder mask 190 (Fig. 2). Therefore, neither Hegel nor Juskey disclose all the limitations of the claimed invention.

Nor does the hypothetical combination of Hegel and Juskey suggest or teach a void that extends only through the upper electrically conductive layer and the underlying resin laminate substrate and not through a lower electrically conductive layer to a lower solder mask. At best, the hypothetical combination of Hegel and Juskey teaches a void the extend through the resin laminate substrate and both conductive layers to the lower solder mask layer. Because the hypothetical combination of Hegel and Juskey does not suggest or teach all the limitations of the claimed invention, Applicant asserts that claim 30 is patentable over the prior art and requests that the Examiner withdraw his rejection of claim 30.

Independent claims 32 and 40, as amended, also recite a void that extends through an upper conductive layer and at least one resin laminate layer but does not extend through a lower continuous conductive layer. Therefore, for the same reasons discussed above, Applicant believes claims 32 and 40 are also patentable over Hegel in view of Juskey, and requests that the Examiner withdraw his rejection of claims 32 and 40.

Claims 33, 34, 41-45, 50, 52 and 53 depend upon the independent claims 32 and 40 either directly or ultimately. These dependent claims are patentable for the same reasons as presented above with respect to the claims from which they depend. Therefore, Applicant believes claims 33, 34, 41-45, 50, 52 and 53 are also patentable over the prior art and request the Examiner withdraw his rejection to claims 33, 34, 41-45, 50, 52 and 53.

Claims 45 and 51 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hegel in view of Juskey and further in view of Papathomas and Marrs. Applicant respectfully traverses this rejection.

Claim 45 and 51 depend on independent claims 32 and 40 either directly or ultimately.

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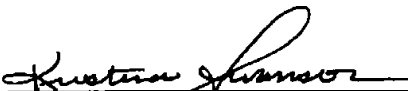
Applicant believes Claims 32 and 40 as amended are patentable over the prior art for the reasons stated above. Claims 45 and 51 are patentable for the same reasons as presented above with respect to claims 32 and 40 from which they depend. Therefore, Applicant asserts that claims 45 and 51 are also patentable over the prior art and requests that the Examiner withdraw his rejection of claims 45 and 51.

CONCLUSION

For the above reasons, the Applicant respectfully submits that the above claims represent allowable subject matter. The Examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,

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